TOOL • DIE • MACHINE

PROGRESS

Official Publication of SPECIAL TOOL, DIE and MACHINE SHOP INDUSTRY

JIGS • FIXTURES • GAGES • MOLDS • SPECIALTIES
MACHINE SHOP PRACTICE • PRODUCTION

SEPT.
1936

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Improved End-Mill Performance

PAT. PEND.

WELDON HOLLOW-END

Mill 5/8" diameter, cuts 1/8" deep in tool steel at 360 R.P.M. at a feed of 14" per minute.

Can You Beat It?

1. Stronger Teeth.
2. No Chip Pockets, make this mill 50% stronger than ordinary double end-mills.

THE WELDON TOOL CO.

321 FRANKFORT AVE
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Pioneers in Fast Spiral Double-end End Mills

Vol. 2
No. 7

SHEET METAL DIES

LARGE DIES
None too large for our facilities.

SMALL DIES
A separate department, manned and equipped for the most exacting requirements.

PATTERNS
Our own complete shop.

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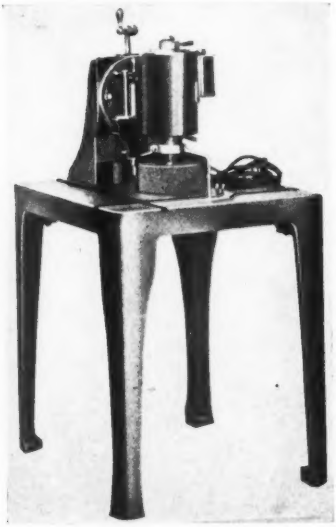
Die making requires fast grinding. We developed the Grindrite to do it. Manufacturers of a varied line of products now use this highly efficient machine tool.

IT CAN REDUCE YOUR COSTS, TOO.



This Heavy Duty Model is unexcelled as a stock remover.

For lighter work you will find the Jr. Model equally efficient.

GRINDRITE quickly pays for itself.

Write us for descriptive circular and list of users.

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KOESTLIN TOOL & DIE CORP.

3605 Humboldt Ave. **Detroit, Michigan**

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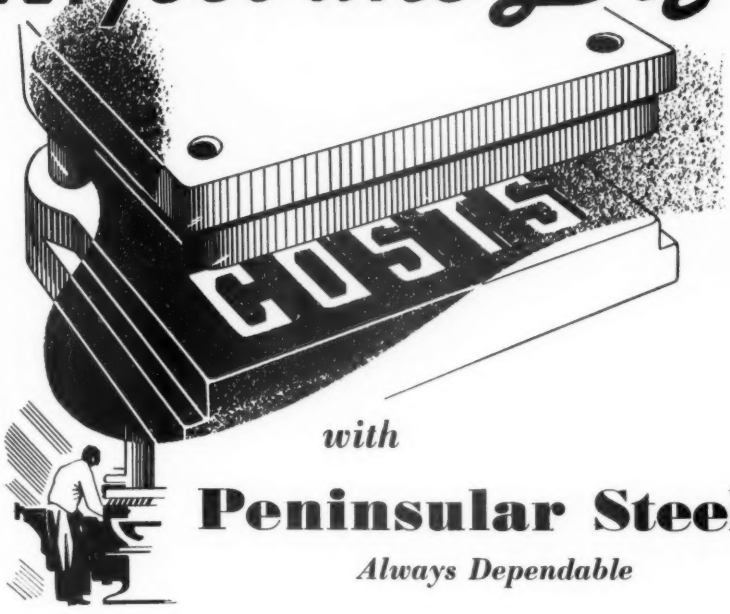
CUT *Tool and Die* COSTS



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Peninsular Steels

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24 HOUR WAREHOUSE SERVICE

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Walter O. Kurtz, *Sec'y-Treas.*

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OLIVER OF ADRIAN DIE MAKING MACHINES

●Reduce Die Making Costs 50% to 60% and more — They're Fast and Efficient on all Sawing, Filing and Lapping Operations.

Bench Model S-1

A VALUABLE ADDITION TO ANY TOOL ROOM

●Present day competition does not permit the operation of a Die Shop (production or otherwise) without the most modern methods—so why not modernize today by installing an Oliver of Adrian Die Making Machine—get the latest and the best—whether your requirements are large or small, we have machines available for every purpose and at prices within the range of every shop—as low as $125.00.

The cuts illustrate our bench model S-1 for 1" materials and the Heavy-Duty for 3" materials. Send for 16-page bulletin.—There's no obligation.

OLIVER INSTRUMENT COMPANY

1416 East Maumee St. **Adrian, Michigan**

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"More Goods for More People"

"What would today's products cost if made by methods in use 20 years ago?"

Under this title and with this question the National Machine Tool Builders' Association puts another dent into the argument that cost-reducing machinery is responsible for unemployment. Industry members who manufacture TOOLS . DIES . MACHINES for production will read this with great interest. The article is quoted verbatim but somewhat abridged. Ed.

IN every period of unemployment machinery takes the rap but it never takes the count.

There is an obvious reason for the first and the most basic of reasons for the second.

Modern machinery came into being in order to help man produce goods in sufficient quantity to meet the demands of a growing population with a rising standard of living. Without the aid of machinery, today's supply would be in primitive and chaotic quantity. Yet, in times of depression, machinery is blamed for the unemployment that hits millions of persons. These and their fellow brothers who are still employed (1) would not have been employed in the first place in such numbers; and (2)—many of them —would not have been alive at all, for, in the struggle for the survival of the fittest during the centuries before the introduction of machinery into man's economic scheme, the populations of the European countries from which our own stemmed were never able to attain to any size at all comparable to those of today.

Thus it is that millions of men and women are alive today and are working today, through the agency of the machine; and that it is possible through the continued improvement and growing dexterities of machines to increase the number of employed and the number of the living.

But a workman watching an automatic machine in operation may reflect that it is doing work which was done years ago by many hands. He decides that it would take at least as many as ten men to make pretty much by hand the many parts that he sees the automatic machine turning out. And extending his vision he comes to the conclusion that were all the automatic machines in the country scrapped, why, presto! the unemployment problem would be solved for good and all.

It is, no doubt, reasoning of this sort that is back of such proposals as that contained in House Resolution 49, 74th Congress, 1st session, which begins as follows:

"*Resolved,* That the Secretary of Labor is requested (1) to compile a list of the labor-saving devices, mechanical and otherwise, put in operation in the United States after December 31, 1912, which are still in use; (2) to estimate the number of persons in the United States now unemployed by reason of each kind or type of such device; (3) to estimate the number of persons who would be employed in the United States in each of the various divisions of industry, commerce, and agriculture, but are not so employed by reason of the use of such devices; etc."

It is understandable why machinery takes the rap for the enforced idleness of our people. For automatic machinery has become so vital a part of our economic life that its very widespread efficiency lays it open to suspicion and attack on the part of persons seeking a solution to the problem of unemployment.

Then is there a basic reason why machinery "does not take the count?"

Products are manufactured for the purpose of being used. Before they can be used they must be paid for. If the price asked is too high, the products cannot be bought. There is only one way to bring the price of things down to fit the ordinary purse and that is by means of mass production, *i. e.*, production for the masses. Mass production can be attained only through the use of automatic machinery. (Even machinery, if not geared to the end of achieving mass production, will produce goods that are as high as the moon from the arms of the common man. Yachts may be made by machinery but they are special

(Continued on page 21)

Two Remarkable New Machine Tool Developments

THERE is probably no machine tool development in the past few years which exceeds in the ingenuity of its control and method of operation the automatic hydraulically operated Die Sinking Machines which are now available. These massive machines are built to take the most punishing cuts, and are automatically controlled by a delicate tracing finger bearing lightly against the contour of a master to reproduce within an accuracy of plus or minus a few thousandths of an inch, the most intricate two or three dimensional surfaces.

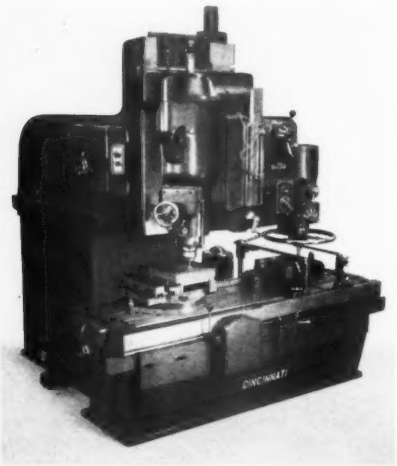


Fig. 1
New Cincinnati Hydro-Diematic — an automatic hydraulically operated diesinking machine.

The movement of the heavy machine slides is obtained hydraulically, producing a smooth and continuous progression of the cutter with respect to the work. Acceleration and deceleration are extremely uniform. This feature makes it possible to attain feed rates which are extremely attractive.

This particular type of machine incorporates two major methods, by means of which the tracer can explore or scan the surfaces of a master. The vertical automatic and horizontal automatic cycles. The first method has its limitations when deep dies, or dies with steep walls, are to be machined. The second method is an entirely new development attaining its highest efficiency when reproducing steep walls. These two cycles are selected by a single lever at the front of the machine. The use of the two methods mentioned above makes it possible to machine any conceivable three-dimensional shapes to a superior accuracy and finish.

A new machine design recently brought out for this particular work is illustrated in figure 1. It is primarily for use on dies produced in sufficient quantities to

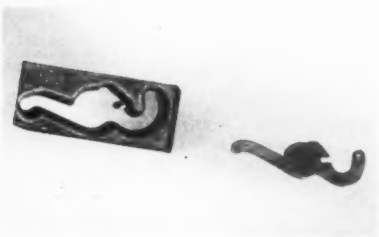


Fig. 2
An example of two-dimensional work. Blanking punch for cash register part, produced by the use of the extremely rapid horizontal automatic operating cycle.

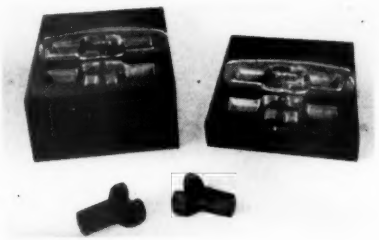


Fig. 3
Automotive drop-forging die together with master from which it was made. The blending of cuts, as obtained by means of the horizontal automatic and the vertical automatic cycle methods, is well illustrated. The excellent finish obtained in a very short time results in a minimum amount of hand-finishing.

When you order or write about products described in TDM PROGRESS please mention the publication.

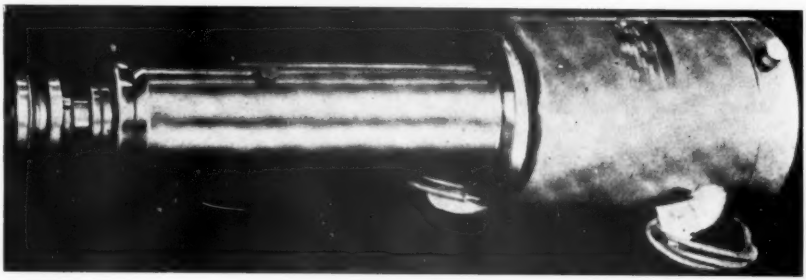
warrant the expense of making [illegible] master.

[illegible] interesting development is the [illegible] illustrated in figure 4. This Cincinnati Hydro-Tel Vertical Milling Machine is also hydraulically operated, the hydraulic movement of the various slides being controlled by adjustably mounted handwheels which may be placed for the maximum convenience of operation. The force required to manipulate any handwheel and thus to move the different elements is not affected by the weight of the die block and the magnitude of the cut taken. This permits the operator to concentrate his attention on the cutter itself and thus secure the maximum output.

Remarkable savings in die cutting time can be made when this same machine is equipped with an automatic depth control in the shape of a tracer mechanism working from a template, which tracer actuates the vertical or axial movement of the cutter.

Fig. 4
New Cincinnati Hydro-Tel Vertical Milling Machine.

GRINDING EFFICIENCY *plus* +



A Parker Motorized Grinding Spindle

assures the utmost . . . From the *Wheel*—the greatest possible production . . . From the *Machine*—the highest precision standards . . . Parker *Four Point Contact* Bearings (Patented) . . . further assure continuous trouble-proof, high-speed spindle operation. The Parker is a compact, self-contained, heavy forged spindle with actuating 3400 r.p.m. motor, designed for easy attachment to existing equipment or to be incorporated in new machines . . . Modernize your grinders with Parker Motorized Spindles.

Information on request.

MAJESTIC TOOL & MFG. COMPANY, 2948 Woodbridge St. East, Detroit, Mich.

When you order or write about products described in TDM PROGRESS please mention the publication.

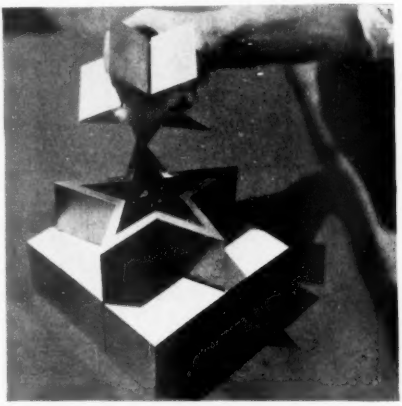
"The New Precision Sawing in Tool and Die Making"

By L. A. Wilkie, Pres.

Continental Machine Specialties, Inc.

(This is the second article on this timely subject—Ed.)

THE subject of narrow blade precision sawing took the spotlight of interest in industrial circles during the past twelve months. At the machine tool show, many asserted that precision sawing was the only really new development. The prospect of this cutting process supplementing "nibbling," torch cutting," "jig" sawing and vertical milling, and doing many operations that were not possible before by any other process, make it a timely subject. Narrow band sawing requires precision bench lathe accuracy. The technique of using this machine is presented further in this article.



This star cut-out is made of 1½" cold rolled steel. The inside took only 1 hour; the outside 1¼ hours.

Electric Brazing Provided

For internal sawing, an ingenious process is employed. The saw blade ends are brazed together after one end has been placed through a starting hole in the work. Making the weld on the saw and the set-up for internal sawing takes a very short time. Provision of a conveniently located, semi-automatic electric saw welding device makes the brazing operation a simple one. Saws will not break at the joint, for an electric braze is stronger than the saw itself. The saw may be reopened at the joint by resetting it in the brazing fixture and applying the electric heat which causes the silver solder to melt. After a joint has been brazed and opened five or six times, it is desirable to make a fresh joint at a new place on the band.

The Brazing Operation

The band saw blade is cut so that one end may be put through the starting hole in the work; then the two ends are rejoined in the brazing unit provided as an integral part of the machine. The steps in making the braze are as follows:

1. Grind a lap in the ends of the saw. This is done with a grinder and lap making jig.
2. The ends are centered between the terminals of an electric transformer and jig. Silver solder and flux are inserted between the lapped ends of the saw.
3. The saw heats when the switch is turned on. At the same time, a clamp

The exacting precision required in tool work is possible with the new narrow saws—when the machine is accurate and rugged. This cam hole has less than .002" variation.

applies pressure which squeezes out the excess silver solder while the joint is being brazed. The saw is stronger at the place where it is brazed than the rest of the band.

4. The surfaces are smoothed with the lap grinding wheel, and the band saw is replaced in the machine.

Total time required for these operations for the internal sawing set-up is less than five minutes.

Specification Tag Attached

Each saw is supplied with a firmly attached tag which specifies length, width, gage, teeth, temper, set and whether the saw is joined or unjoined. On the reverse side of the tag appear the following precautions:

1. Be sure you are using the correct number of teeth per inch for the material you are cutting.
2. Use the widest saw consistent with the radius of curves to be cut.
3. Tension on new saws should be medium. The saw will stretch slightly after it is used. This stretch should be taken up and the tension on the saw can be increased slightly.
4. The teeth must project clear of the guides.
5. The roller bearings should turn only when pressure is put on the saw.
6. This adjustment is controlled by tilting the upper wheel, causing the band to track in the right position on the wheel.
7. The upper guide should be as close to the work as possible.
8. Do not force the cut on curves.
9. Release tension on the band when the machine is idle.

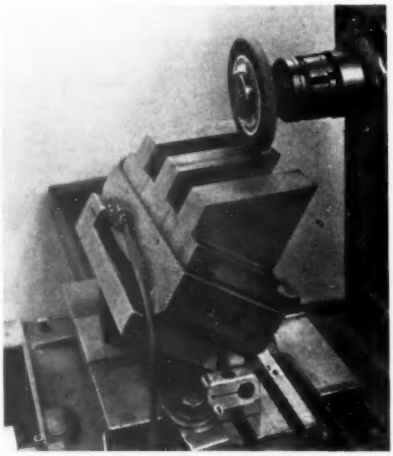
Cutting Speed Is Important

Following is tabulated a general classification of materials and cutting speeds required.

Speed in Feet per Minute	Material
75 to 110	High chrome, high-carbon steel Alloy steel of high carbon content High speed steel High-carbon steel (over 0.75) Hard steel and special alloys

(Continued on page 27)

SAVES HOURS of SET-UP TIME



Grinding gauge blocks in sets of three on the MAGNA-SINE. A set-up was made in only a few seconds with absolute assurance of precision accuracy.

The most outstanding time-saving, money-saving piece of equipment introduced to the machine shop field in years! It's the MAGNA-SINE—a magnetic sine table which holds a magnetic material at any angle—either single or compound—for purposes of grinding or other operations.

In only a few seconds, any angle or combination of angles can be set up with precision accuracy positively assured. The magnetic principle eliminates the need for angle plates, clamps and bolts. In actual average shop operation it has been proved that the MAGNA-SINE invariably pays for itself in two or three months time. Complete information regarding its adaptability to any type of work will be furnished without obligation upon request.

THE MAGNA-SINE

Manufactured by

ROBBINS ENGINEERING CO.

635 Mt. Elliot Ave. Detroit, Mich.

When you order or write about products described in TDM PROGRESS please mention the publication.

The "Hole Wizard" by American

A NEW radial drill recently developed by The American Tool Works Company of Cincinnati, Ohio, and known to the trade as the "Hole Wizard" offers, according to the manufacturer, a feature of particular interest to the tool and die industry. The manufacturer claims for this new machine not only the greatest speed and economy in performing the conventional drilling and tapping operations, but a surpassing aptitude to the accurate boring and spot facing operations so frequently encountered in the tool and die shop. The adaptability of the Hole Wizard to work of such character is one of its outstanding virtues and is the direct result of a new and highly stabilized spindle construction.

The drive to the spindle is by means of hardened and ground helical gears. This provides a smooth power transmission to the spindle and a very quiet drive even at the highest spindle speeds.

The spindle and spindle sleeve are made of "Nitralloy" steel nitrided for extreme surface hardness. The spindle is ground to very close limits and the sleeve is honed to precision limits. These units being hardened are practically impervious to wear and will never become sloppy. The hardening of these members also permits of a much closer fit between the two, resulting in a precision mounting that lends itself to the most accurate drilling and boring for tool room operations, die making and jig boring.

The driving sleeve is mounted on Timken Precision Bearings at top and bottom with means for take-up in case of wear. This insures not only a drive free from friction, but one whose original accuracy can be maintained for many years.

The Hole Wizard is offered in 3 foot and 4 foot sizes and in 9 speed and 12 speed types. It is driven by a built-in, high reversal, shell type motor on the head and is equipped with a 9 inch diameter column. The manufacturer's Bulletin No. 309-D, thoroughly descriptive of this machine, is offered gratis to those writing for it.

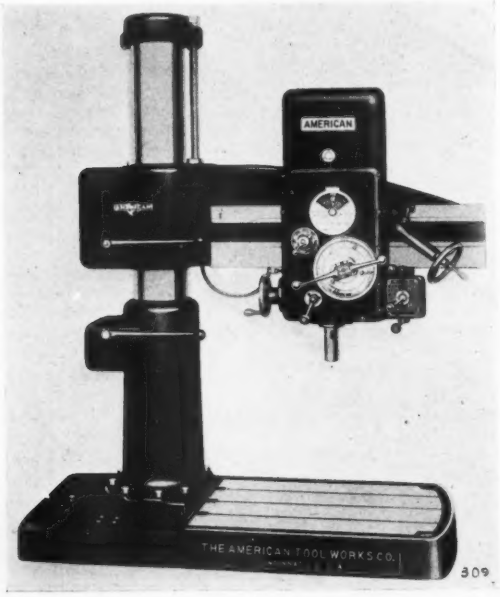


Fig. 1

The American Hole Wizard.—An interesting new spindle construction (see detail on next page) makes of this a super-efficient machine for the tool and die shop.

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Fig. 2

The Nitralloy Steel Spindle of the Hole Wizard.

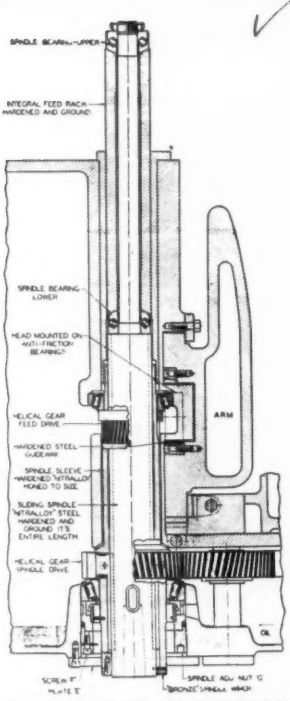
SPINDLE BEARING—UPPER
INTEGRAL FEED RACK HARDENED AND GROUND
SPINDLE BEARING LOWER
HEAD MOUNTED ON ANTI-FRICTION BEARINGS
HELICAL GEAR FEED DRIVE
ARM
HARDENED STEEL GUIDE WAY
SPINDLE SLEEVE HARDENED NITRALLOY REAMED TO SIZE
SLIDING SPINDLE NITRALLOY STEEL HARDENED AND GROUND IT'S ENTIRE LENGTH
HELICAL GEAR SPINDLE DRIVE
OIL
SCREW F PLATE E
SPINDLE ADJ. NUT G BRONZE SPECIAL WASH

Fig. 3

Spindle Construction in Detail. Note that design and construction are such as to combine great speed with a high degree of stabilization.

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FOR SUPERIOR QUALITY

Inventors of Modern High CHROMIUM STEELS for Quantity Production with Press-Tools . . . .

"NEOR" — "COBALTCROM-P.R.K"
"DARWIN No. 1" — "H" Brand
"PRK" and "H" also in the form of Castings

Pioneers of Cobalt-Alloyed High-Speed Steels
Also supplied in the form of Tool-Bits

AUTOMOTIVE CARBON DIE
Carbon Vanadium Water Hardening Steels

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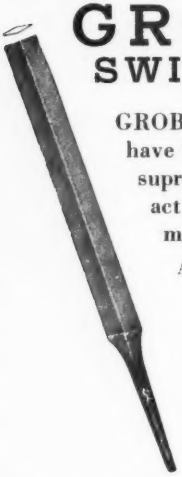


GROBET SWISS FILES

GROBET SWISS FILES have won a reputation for supremacy wherever exact and precise work must be done with files.

Ask for our catalog YN, the most complete of its kind, showing more than 4,000 different shapes, sizes and cuts of precision files, also files for filing machines, rotary files, etc.

Grobet File Corp. of America

3 Park Place New York City

The Portable Elevating Table —A Real Labor Saver

CONVENIENCE frequently spells efficiency and to do a thing efficiently is to save time in the doing of it.

A portable elevating table for the conveying of heavy dies and machine parts in the most effective manner possible has been developed and is now being built by the Hamilton Tool Company, 222 North B St., Hamilton, Ohio.

In a die shop the *Hamilton Portable Elevating Table* has many uses. It acts as the support for large overhanging pieces on which work is being done on jig-borers, horizontal mills, and drill presses.

The load is carried on a table which is raised or lowered by means of the crank handle. *Timken* thrust bearings assure ease of operation.

In a stamping plant the *Hamilton Portable Table* is really indispensable. It requires only one man to convey a heavy die from its shelf to the press. In each instance the table is raised or lowered to make it level with the shelf or press.

These *Elevating Tables* are furnished in two standard styles and sizes, style "A" and style "A-2." The style "A" table has a top surface of 21" x 33" and its height from the floor is 25". When fully elevated the table is 38½" high. The style "A-2" table has a top surface of 26" x 38", its height from the floor is 28" and when elevated it is 41½" high. The carrying capacity of the "A" table is 2,000, of the "A-2", 5,000. Special sizes are made to order.

Portable Elevating Table with rotating top. Operated by a ¼ H.P. electric motor, this table has a lifting range of 22 inches.

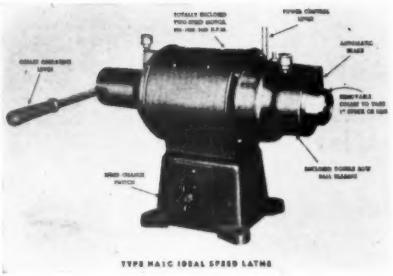
The accompanying photograph is an example of an electrically operated *Elevating Table*. This *Elevating Table* has a rotating top resting on a series of steel balls. A ¼ HP single phase geared motor furnishes the power for raising and lowering the top. Push button stations for raising, lowering and stopping are provided. Also limit switches to stop the motor are provided when a predetermined elevation is required. The minimum height of this *Elevating Table* is 30" and the maximum height is 52". *Timken* roller bearings are provided to support the screw thrust and *Hyatt* roller bearings provide for easy rolling of the wheels and casters.

When you order or write about products described in TDM PROGRESS please mention the publication.

It Can Be Done Quicker On A Speed Lathe

SPEED LATHES are absolute necessities in many plants, in others they are an auxiliary tool which can be a genuine time saver. For fine finishing, polishing and lapping small parts, a *Speed Lathe* is unusually efficient. The Schauer Machine Co., Cincinnati, O., manufacture the *IDEAL* line of electric *Speed Lathes*, of which one model is illustrated herewith. There are frequent occasions when a *Speed Lathe* will obviate the necessity for setting up a job on a standard lathe which, because it does not have high speed and quick-stop operation, often turns out to be a makeshift for that particular job and results in its being done most uneconomically.

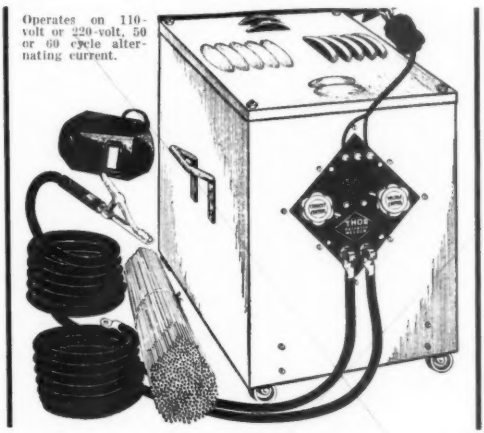
IDEAL Speed Lathes have in-built two-speed, ¼, ½ or 1 HP, totally enclosed, dust-proof motors. There is an automatic foot pedal control of power, brake and check.



TYPE MA1C IDEAL SPEED LATHE

An automatic brake, which is an exclusive and patented feature, is automatically applied the instant electric current is cut off. This brake, using an automobile type brake shoe, is said to stop the motor from top speed in two seconds, and does it with velvet smoothness.

A highly descriptive illustrated circular will be sent on request to the Schauer Machine Co., 901 Broadway, Cincinnati.



Operates on 110-volt or 220-volt, 50 or 60 cycle alternating current.

HEAVY DUTY ELECTRIC ARC WELDER

only $95.00 Complete with accessories

FLASH! Here is "front page," sensational news for every shop—large or small—in the TDM Industry. Now—a powerful, professional, HEAVY DUTY Arc Welder at only $95.00, complete with all accessories. Safe, simple, portable . . . anyone can use it . . . works on 110-volt or 220-volt, 50 or 60 cycle alternating current . . . costs but a few cents an hour to operate. Does all types of welding. Repairs tools, dies, jigs, molds, fixtures, etc., etc. Also invaluable as a maintenance tool to avoid shut-down delays while waiting for expensive repairs or replacements.

Fully Guaranteed

The THOR Electric Arc Welder is a revolutionary new kind of patented Arc Welder that is GUARANTEED to do all the work that can be done with electric arc welders costing $50.00 to $1400.00 more. Consider this list of THOR features, many of which are EXCLUSIVE! High efficiency, uniform current, automatically stabilized arc, fine adjustment, nine stages of heat control, modern simplified design, welded steel construction, portability, smooth performance, durability, ease and speed of operation, and low price.

Thor Welder Factory

EQUALS WORK OF $150.00 TO $1500.00 EQUIPMENT!

The THOR can pay for itself on its first job or two. Ends sub-letting welding jobs—keeps all the profits in your shop. Any of your mechanics can follow our simple instructions about making all kinds of welds and EARN PROFITS FOR YOU.

Amazing details... FREE!

Send today for amazing details about Thor Electric Arc Welder at only $95.00, complete with accessories. You are not obligated in any way. Just write.

Union Levee at Winter St., Cincinnati, O.

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Don't Take the Chance..

BE CERTAIN

USE

"ALNOR" PYROMETERS

Our 36 years experience enable us to manufacture and sell a better pyrometer at a lower price — actually for as little as $13.00.

Write for catalog

ILLINOIS TESTING LABORATORIES, Inc.

421 N. La Salle St. Chicago, Ill.

Many Machine Tools Can Be Modernized Inexpensively With Parker Motorized Spindles

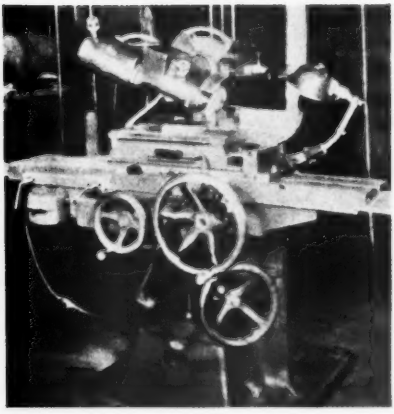
WHEN the Dodge Division of the Chrysler Corporation added forty surface and special-purpose grinders, *Parker Motorized Spindles* were specified.

The remarkable precision standards which have been developed and maintained by the automotive industry are due, to no small extent, to the great efficiency developed in grinding equipment. This is particularly notable when one considers the volume production which has been achieved.

Parker direct-driven *Motorized Spindles*, one of which in use on a broach grinder is shown herewith, effect a direct operating-cost saving over belt drives. Usually a ¾ HP motor replaces the 1 HP motor necessary for the less efficient belt drive. This alone shows a 25% power saving and when idlers are used with a belt drive, the claim is made that the *Parker Spindle* will operate at approximately half the cost. Belt replacements and the time consumed with the grinder out of commission are entirely eliminated. These can show a considerable saving.

The *Parker Motorized Spindle* is a self-contained heavy forged spindle, with actuating 3400 r.p.m. motor enclosed in a compact unit which can be easily incorporated in existing equipment. *Parker*-made *Bearings* assure perfect operation under the most difficult circumstances. There is no end-play and the possibility of wheel spindle chatter is eliminated.

The Majestic Tool & Mfg. Co., 2956 E. Woodbridge St., Detroit, Mich., is the manufacturer of *Parker Motorized Spindles* which are adaptable to all types of grinders, as well as diamond boring machines. Catalogue and prints showing application to machine tool equipment now in operation and method of incorporation in new equipment will be sent upon request.



Parker Motorized Spindle in Service on a Broach Sharpening Machine

When you order or write about products described in TDM PROGRESS please mention the publication.

Precision Sawing – Filing and Polishing

For internal sawing you braze the saw (after one end has been placed thru a starting-hole). So simple a child can make a perfect braze with the "built-in" semi-automatic brazing unit. TIME: Less than three minutes. The braze is stronger than the rest of the saw.

CUT ANY METAL FROM THE TOUGHEST HIGH CHROME, HIGH CARBON STEEL TO ALUMINUM. HERE IS THE INFINITELY VARIABLE SPEED CONTROL FROM 75 TO 450 FEET PER MINUTE.
CONTINENTAL
DO DUAL ALL
Continuous
INTERNAL AND EXTERNAL
ONLY 2½ HRS. FOR MAKING THE ENTIRE JIG!
LESS THAN .002" VARIATION TOP TO BOTTOM
1 HR. INSIDE
1¼ HRS. OUTSIDE
1½ HRS. INSIDE
2 HRS. OUTSIDE
OUT IN 28 MIN.
TAKES THE JOB RIGHT THRU

PRECISION contour sawing — filing and polishing requires that this new machine tool be as rugged as a milling machine and as accurate as a precision bench lathe. That is why all castings are seasoned nickel-iron, eight SKF bearings are installed and all sliding parts are hand fitted.

PAYS ENORMOUS RETURNS
BUY NOW

as little as
10% DOWN
as low as
$25 MONTHLY
6% finance plan (1% per month)

CONTINENTAL MACHINE SPECIALTIES INC. MINNEAPOLIS, MINN.

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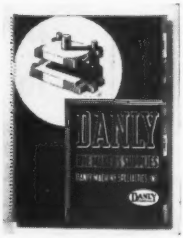
ACCURACY AND ECONOMY CALL FOR

DANLY PRECISION DIE SETS



The Danly Catalog gives you the most complete listing on the market—makes it easier to select the proper set to fit the job. Send for your copy.

● 7/1000 of 1¢ per piece is a mighty small cost for the extra advantages a Danly Precision Die Set gives you on a run of 60,000 stampings. More accurate die cut parts throughout the run without "burrs" may spare you the entire expense of finishing. Perfectly aligned die movement is assured because hardened pins and bushings are lapped to within ±1/10,000", eliminating side play, irregular wear and delivering more accurate parts from the first to the sixty-thousandth. Before buying your next die set, get information on Danly Precision sets, of which many are still in service after hundreds of thousands of pieces.

DANLY MACHINE SPECIALTIES, Inc., 2121 S. 52nd Ave., Chicago, Ill.

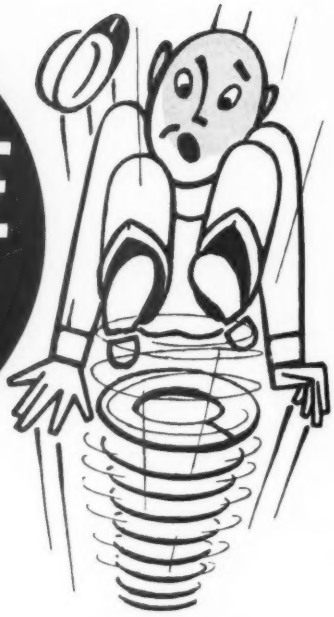
BRANCHES:

Long Island City, N. Y., 36-12 34th Street
Dayton, Ohio, 990 E. Monument Avenue
Detroit, Michigan, 1549 Temple Avenue
Rochester, N. Y., 16 Commercial Street
Cleveland, Ohio, 1444 E. 49th Street
Philadelphia, Pa., 3913 N. Broad Street

DANLY PRECISION DIE SETS

When you order or write about products described in TDM PROGRESS please mention the publication.

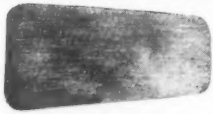
BUY PRESSURE NOT JUST STEEL!



You'll get plenty of kick out of these new Danly flat rounded springs—they're new and entirely different—livelier—stronger—longer lasting! They're engineered to combine a maximum flexibility with carrying capacity and compression.

DANLY FLAT ROUNDED DIE SPRINGS

● The reason they're better lies in the fact that they are made of a special analysis keystone wire which, in destruction tests covering three years, showed the highest fatigue life ever known in spring steel. The keystone wire when coiled, takes a rectangular cross-section to give it equal strength on both inside and outside spring diameters—greater carrying capacity for hole size. It means longer life and fewer spring replacements for you. *The new Danly Spring Chart describes it more fully. Send for your copy today.*



The special analysis steel wire is drawn in this keystone shape.

When coiled, it takes this shape to give it greater strength, longer life. When you start with ordinary flat wire the exact reverse is true.

DANLY MACHINE SPECIALTIES, Inc., 2121 S. 52nd Ave., Chicago, Ill.

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Long Island City, N. Y., 36-12 34th Street
Dayton, Ohio, 990 E. Monument Avenue
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Rochester, N. Y., 16 Commercial Street
Cleveland, Ohio, 1444 E. 49th Street
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DANLY DIE MAKERS' SUPPLIES

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TOOL · DIE · MACHINE
PROGRESS

Published in the interest of
Manufacturers and Users of
CUSTOM-BUILT TOOLS, DIES, MACHINES AND ACCESSORIES

GEORGE J. HUEBNER . . . . . Editor
P.O. Box 3561, Cleveland, Ohio

Official Publication of the
SPECIAL TOOL, DIE AND MACHINE SHOP INDUSTRY
3590 Members in the U.S.A.

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A National Trade Association

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Cleveland, Ohio

New Federal Revenue Act Exempts Advertising Expenditures

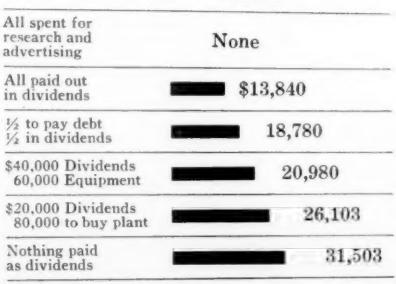
IN its business bulletin of September 15th the Cleveland Trust Co. calls attention to an analysis of the new Federal Revenue Act made by the INDUSTRIAL BULLETIN, published in Cambridge, Mass. It is pointed out "that the new Revenue Act may cause more changes in corporate management and fiscal policy than any other legislation of this generation. It considers the alternative courses that may be pursued by the directors of a corporation having a taxable income in this calendar year estimated in advance to be $100,000. These alternative courses are illustrated in the diagram.

"The Board may decide to spend all its earnings for research and advertising, and since it will then show no profit, it will have no taxes to pay. By following this course the earnings will have been reinvested in the business for the future. The next alternative is to pay the $100,000 all out this year in dividends, and in that event the income tax will be $13,840, with no surtax on undistributed profits. In that event nothing will have been reinvested in the business.

"The directors might think it advisable to pay only $50,000 in dividends, and to reduce by $50,000 a bank loan, but then the government would collect an extra $4,940 in taxes because of the payment of the debt. This would bring the total taxes up to $18,780, so the bank would probably be requested to renew the loan. It might seem wise to spend $60,000 to replace obsolete equipment, and to pay $40,000 in dividends, but then the actual cost of the machinery would turn out to be $67,140 because of the surtax on that portion of the earnings not distributed as dividends, and so the total taxes would be $20,980.

"The corporation might have a favorable opportunity to buy the land and buildings it occupies for $80,000, but the directors would find that the purchase was not necessarily a bargain for the government would collect a surtax of $12,263 on the funds so used and the total taxes would amount to $26,103. Finally the directors might decide to pay no dividends but to use all the income earned during the year for the purpose of building up the cash resources of the company. This is the most expensive course of all and would bring the total taxes up to $31,503, or almost 32 per cent of the year's income. In effect the new Revenue Act offers a subsidy of almost 32 per cent to corporations with large potential profits which can devote their current earnings to research, advertising, sales promotion, and other expenses which by established tax practice need not be capitalized."

TAXES ON CORPORATE INCOME OF $100,000



THE FASTEST-GROWING TRADE MAGAZINE IN AMERICA

TO begin with we admit that we do not have a record of the growth during the last six months of every trade magazine published . . . .

BUT we haven't heard of any that is stepping along like Tool-Die-Machine PROGRESS . . . .

THEREFORE if this should come to the attention of the editor of a faster-growing publication, we shall withdraw our claim and apologize for our presumption.

★ ★ ★

IN the meantime, however, here are the facts:

IN March, 1936, Tool-Die-Machine PROGRESS contained 16 pages . . . .

IN September, 1936, 32—an increase of 100% in *six months* . . . .

★

IN March the circulation was a scant 3500 . . . .

IN September 7000—another increase of 100% in six months . . . .

★

IN March 1936 there were less than 4 pages of advertising . . . .

IN September 1936 almost 17, an increase of more than 300%.

★

THOSE few intrepid advertisers who took the long chance in the early days have been rewarded . . . .

TODAY they are with us on a twelve-months contract basis.

★

SPACE rates have not been increased in anywhere nearly the same ratio as circulation and today Tool-Die-Machine PROGRESS, with its rapidly expanding reader interest, its highly selective ever-increasing circulation, is a real producer of results.

IF you have something to sell the *tool and die shops*—contract and "captive," the *builders of special machinery, the users* of all of these products in the various production industries . . . .

THEN Tool-Die-Machine PROGRESS should be carrying your sales story.

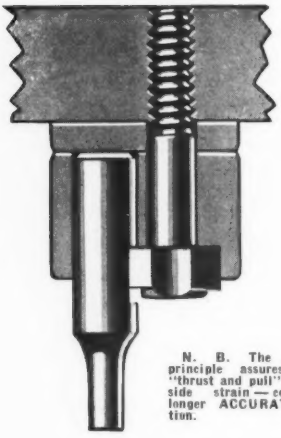
WILL you go along?

Write us now for our rates.

GEO. J. HUEBNER, *Editor.*

When you order or write about products described in TDM PROGRESS please mention the publication.

EASIER REMOVAL
QUICKER REPLACEMENT *of* PUNCHES



N. B. The Screwlock principle assures straight "thrust and pull" action, no side strain — consequently longer ACCURATE operation.

THE HOVIS SCREWLOCK RETAINER

is the most scientifically constructed of all "quick-change" punch and die retainers. The shoulder on the punch is at right angles with the axis and, with the use of an alloy steel screw and properly heat treated punches, the Screwlock will pierce and strip metal of a thickness comparable with any known method of holding piercing punches.

FOR GROUP PLATES

Screwlock construction is unequalled. One setting on a jig borer will complete a group plate ready for mounting, excepting only counterboring for the screwheads. Retainers made and in continuously satisfactory service have as many as 156 punches.

Our prices will interest you. May we quote?

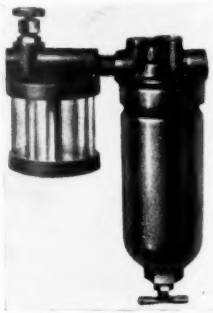
HOVIS SCREWLOCK CO.

3129 East Larned Street **Detroit, Michigan**

Automatic Filter And Lubricator Insure Against Shut-Down And Excessive Wear of Air Tools

USERS of air propelled tools will recognize at once the value of removing all foreign matter—dust, pipe scale, moisture, etc.—from the air line. The *M-B Filter* is designed specifically for filtering fluids under high pressure and it is particularly valuable for the protection of small air tools and spray guns from air line dirt and water. Eliminate water from a compressed air line, and there is an immediate increase in the efficiency of the tools. Now add to this filter an automatic air line lubricator, and further efficiency is immediately apparent.

The *M-B Automatic Air Line Lubricator and Filter*, as illustrated, operating to eliminate from the air line all dirt and moisture, as well as introducing a sufficient supply of oil to properly lubricate all tools in use, is said to provide a most inexpensive insurance against excessive wear and deterioration. Also, this positive lubrication of pneumatic tools, in eliminating the necessity for the frequent use of an oil-can, results in a saving of the worker's time.



The M-B Lubricator, for use in ¼" to 1" standard pipe, is simple in construction and efficient in operation. The oil level is visible at all times and a valve controls the volume of vaporized oil for lubricating continuously all working parts. The dual unit should make costly shut-downs of air-operated equipment unnecessary.

For further information address M-B Products, 128 E. Larned St., Detroit, Mich.

When you order or write about products described in TDM PROGRESS please mention the publication.

'More Goods for More People'

(Continued from page 5)

jobs like fine houses and the machines used in making them are not geared to mass production.)

Suppose for a moment that automobiles are made like yachts. Mr. Walter P. Chrysler, automobile manufacturer, recently estimated that an automobile which today sells for $600 would cost, if made by non-mass production methods, at least as much as $3,500. According to figures furnished by the Automobile Manufacturers' Association, in 1935 in the above-$3,000 wholesale price range, 2,428 automobiles were sold in the United States and Canada. But *of all price ranges* somewhere in the vicinity of 4,000,000 cars were sold this same year.

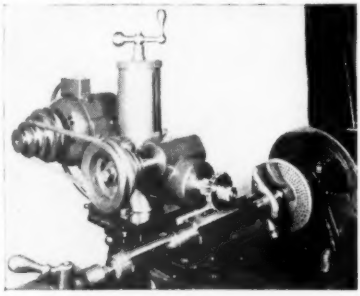
It is impossible to justify this with House Resolution 49, quoted above. Let us suppose, further, that as a result of the enactment of this or a similar resolution, it was decided to do away with "the labor-saving devices, mechanical and otherwise" and to revert to the machine shop methods which were in use at about the turn of the century. The result would be that, presto! the yearly market for automobiles would become limited possibly not to 2,428, but surely to less than a full day's output of any of several plants. Where would the gain be? It would not be in the direction of the unemployed because, in its straitened condition, the automobile industry could not provide jobs for the million or so persons it now directly or indirectly employs, let alone providing for any of those at present unemployed. And if we took into consideration the larger social and economic crippling of our transportation facilities, an even more staggering conception can be gained of the utter indispensability of *cost-reducing* machinery (it is, you will agree, incorrect to term it *labor-saving*).

The reason why machinery "does not take the count" is basically because cost-reducing machinery is job-making machinery. Low prices create a demand and demand creates jobs. Further factual evidence of the cost-reducing power of modernized mass production is presented herewith in the form of a symposium of leading industrialists on the

(Continued on page 23)

PRESTO ★ ★ ★

Your lathe becomes a machine tool of many functions . . .



The

MASTER LATHE CONVERTER

is precision-built

Easily mounted upon your lathe it does: MILLING, SPLINE WORK, SHAFT WORK, GEAR CUTTING AND HOBBING. It broaches internal keyways. It drills on or off center and at all angles. It readily does internal and external grinding — face plate, surface, reamer flutes and hobs. It faces valves and grinds brake drums.

It does the work of individual purpose machinery and there is but a fraction of the investment.

*

Write for illustrated pamphlet.

Be sure to state make and size of lathes and inside dimensions of tool post T-slot to be fitted.

MASTER MACHINE & TOOL COMPANY

North Kansas City, Missouri

We can use a few more territorial representatives

When you order or write about products described in TDM PROGRESS please mention the publication.

A Heavy Duty Welder at A New Low Price

TODAY there are very few shops which do not have the necessity arise for a quick welding job. It may be incidental to the production of a special tool, die, or machine or again it may be required because of a break-down. Under any circumstance, to have a welder in the shop available for immediate use is highly desirable and may be the means of avoiding an expensive delay.

A heavy-duty *Electric Arc Welder* which sells, complete with all accessories, at an unusually low price has recently been announced by the Thor Welder Factory, Union Levee at Winter St., Cincinnati, Ohio.

The *Thor Welder* has been developed on an entirely new, revolutionary principle. It is patented and guaranteed by the manufacturer to do work which equals that done by arc welders costing several times its price. It operates from any 110 or 220 volt, 50 or 60 cycle A.C. socket, and is particularly adaptable to all types of welding in the manufacture, repair and maintenance of tools, dies, jigs, molds, fixtures, as well as production equipment.

The exceedingly low price of the *Thor Welder* would seem to make it profitable for every shop to have one and particularly so in view of the manufacturer's claim that its high efficiencey is out of all proportion to its price and cost of operation.

Grinds Mills, Cutters, Reamers With Accuracy

ACCURATE grinding of milling cutters, including straddle mills; slab cutters; staggered side cutters to 6"; shell reamers, back-off reamers; counter bores; counter sinks; gear hobbers; rose reamers; and saws with ⅞" and 1" hole, —any thickness—is guaranteed by the manufacturer of the new *Little Wonder Grinder*.

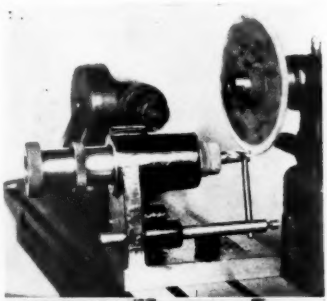
Figure No. 1 shows the set-up for grinding the end of a cutter. Adjustment is simple. The stop collar is lowered to the bottom of the grinding wheel and thus proper clearance for the end-teeth is assured. If a center pitch is desired, fixture is easily adjusted. The tooth is then set on center and the fixture placed against straight edge for end grinding. For this operation the saucer type grinding wheel is recommended and it is said to be possible to sharpen an end-mill in less than ten minutes.

Figure 2 shows the extremely simple procedure when grinding a stradle mill. The stop collar is locked, the guide pin properly set. The fixture is placed on the grinder and again the estimated time to grind the top of a 6" mill is just ten minutes. The construction of the *Little Wonder* grinding fixture is such as to assure the teeth being always square with the wheel.

The *Little Wonder Grinder* is an inexpensive fixture. Tool crib attendants are readily trained to use the *Little Wonder* because of its simplicity.

For further details write the Luther Manufacturing Co., 58 Knecht Dr., Dayton, O.

Fig. 1



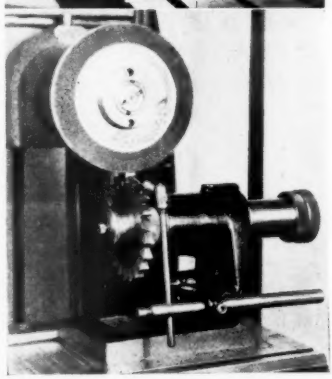


Fig. 2

When you order or write about products described in TDM PROGRESS please mention the publication.

SHEET METAL STAMPINGS
OF EVERY DESCRIPTION
FLASH *and* PROJECTION WELDING
Die Engineering Service *Assembling*
MEADO PRODUCTS COMPANY
2530 24th St. *We have the facilities* DETROIT, MICH.

'More Goods for More People'

(Continued from page 21)

probable costs of common articles of use if the nation were to revert to earlier methods of producing them.

Even the typewriter on which these words were prepared for the printer would have cost $1,000 instead of $110, according to Mr. S. H. Ensinger, Advertising Manager of Remington Rand, Inc., makers of the machine.

And pity the poor high school and college students and the struggling authors who now peck away on $60 portable typewriters, if instead of the most modern machine-tooled machines, primitive machine-shop equipment similar to that which turned out the first automobiles had been used to manufacture these typewriters. Most present day students and writers would go begging for portable machines—unless, of course, they had all of $650 to spend for a luxury equivalent in price to the present cost of a moderately priced piano.

Similarly, store keepers who now spend $75 for adding machines to aid them in keeping their accounts would be forced to spend $700 for the cheapest machines —or do without.

One of the oldest and most famous achievements of Yankee ingenuity was the manufacture of clocks, which for generations were made by the currently latest factory equipment and methods. The result was a market price which was the astonishment of the world. That tradition is being kept alive today. A popular line of alarm clocks selling in two models for $2.95 and $3.50 would, if now produced piecemeal by machine shop methods, sell for at least $25, according to the estimate furnished by Mr. A. J. Wilson, Vice President of the Western Clock Company.

The president of another company, Mr. James R. Sheldon, of the Ingersoll-Waterbury Company, states that "the labor cost of turning out watches piecemeal by machine shop methods would

(Continued on page 26)

ALLOY HY-TEN STEELS
ALSO POPULAR S.A.E. ALLOY GRADES
SUITABLE FOR A WIDE VARIETY OF USES
HY-TEN "M" TEMPER
Oil Hardening Alloy Steel
For parts requiring great hardness, density of structure, resistance to wear, combined with toughness.
HY-TEN B No. 3X
.50 C. High Man.-Chrome-Moly
Machinable in heat-treated condition at hardnesses up to 42 Rockwell "C" (401 Brinell) or even higher.
Warehouses CAMBRIDGE CHICAGO CLEVELAND
WHEELOCK, LOVEJOY & CO., Inc.
SEND FOR DATA SHEETS
Warehouses DETROIT NEWARK BUFFALO

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You Ought To Have These Practical Books

PUNCHES, DIES AND TOOLS FOR MANUFACTURING IN PRESSES.

By JOSEPH V. WOODWORTH. Fourth revised and enlarged edition. 538 pages. 736 engravings.....$5.00

An encyclopedia of die-making, punch-making, die-sinking, sheet-metal working and making of special tools, subpresses, devices and mechanical combinations for punching, cutting, bending, forming, piercing, drawing, compressing and assembling sheet-metal parts and other materials in machine tools. This is an entirely different work from the author's book "Dies; Their Construction and Use."

ENGINEERING SHOP PRACTICE.

By ORLAN WILLIAM BOSTON, M.S.E., M.E., Professor of Metal Processing and Director of the Department, University of Michigan. Vol. I. 539 pages. 6 by 9. Cloth..net $5.50

"Engineering Shop Practice" deals with the relation between the design of the part, the material of which it is to be made, the method of fabrication by which the material is to be prepared, and the machining processes involving the machine tool, fixtures, cutting tools, speeds, feeds, lubricants, etc.

CONTENTS — The Machine Shop. Lathes. Shapers. Planers. Cutting Tools for Lathes. Planers and Shapers. Milling. Sawing. Drilling. Boring. Reaming and Threading.

Vol. II. 485 pages. 6 by 9. Cloth, net $5.00

CONTENTS — Turret Lathes and Screw Machines. Automatic Turning Machines. Broaching. Grinding. Polishing. Buffing. Lapping, and Honing. Gears, Gear Cutting, Finishing and Inspection. Cutting Fluids. Presses, Punch and Die Work; Spinning. Die Casting. Standardization. Industrial Management and Organization. Measuring Instruments and Gages. Jigs, Fixtures, and Special Tools. Accounting and Costs. Time and Motion Study, Routings. Stock Records and Control. Wage-Payment Plans and Incentives.

MACHINE-SHOP TOOLS AND METHODS.

By W. S. LEONARD, formerly Instructor in Machine-shop Practice and in Practical Machine Design, Michigan Agricultural College. Seventh Edition, Revised and Enlarged. 573 pages. 6 by 9. 702 figures. Cloth.....net $3.50

A description of the design, purpose and operation of the tools in common use in machine shop practice.

DIES; THEIR CONSTRUCTION AND USE FOR THE MODERN WORKING OF SHEET METALS.

By JOSEPH V. WOODWORTH. Seventh revised edition. 426 pages, 546 illustrations. $4.00

A book by a practical man, for those who wish to know about the working of sheet metals. It shows how dies are designed, made and used. Laying out of dies to save metal is described thoroughly. Manufacture of heavy dies for forming metal parts is described in detail and illustrated with reproductions of photographs, taken under actual working conditions. Working of heavy drawn parts such as automobile rear axle housings also is described.

MACHINE DESIGN.

By LOUIS J. BRADFORD, M. E. Professor of Machine Design, Pennsylvania State College, and PAUL B. EATON, Professor of Mechanical Engineering, Lafayette College. Third Edition. 289 pages. 5½ by 8½. Cloth.....$3.00

Meets the requirements of a short course in machine design. Fundamental facts and processes are stressed.

CONTENTS — Fundamental Definitions and Considerations. Friction and Lubrication. Bearings and Sliding Surfaces. Friction Clutches and Brakes. Shafts. Force and Shrink Fits. Screws and Screw Fastenings. Toothed Gearing. Wrapping Connectors. Springs. Flywheels. Miscellaneous Machine Elements. Index.

MATHEMATICS AND THE MACHINIST'S JOB. THE PRACTICAL MATHEMATICS OF THE MACHINIST'S TRADE.

By FRANK CUSHMAN, Chief Trade and Industrial Education Service, U. S. Office of Education. 226 pages. 4¾ by 7. 134 figures. Cloth. net $1.75

A progressive course in related mathematics, based upon an analysis of the machinist's trade. Beginning with arithmetic and extending through the important and more useful part of trigonometry the problems deal with practical shop data and concrete experiences. In addition to the presentation of practical methods for the solution of shop problems the text includes an organized course in general trade mathematics.

THESE BOOKS SENT PREPAID ON RECEIPT OF PRICE

Tool - Die - Machine PROGRESS, Box 3561, Cleveland, Ohio

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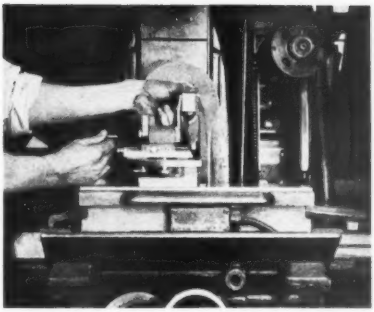

Combined Radius and Angle Grinding Wheel Dressing

SIMPLIFIED by the

ROYAL GRINDING WHEEL DRESSER

Accurate • Positive • Eliminates Guesswork

ROYAL GRINDING WHEEL DRESSER COMPANY

ELmhurst 6580 Box B Royal Oak, Michigan

Employees Save Time With Good Tool Chests

TOOL makers, die makers, skilled mechanics of every kind who are required to have their own tools should have proper storage for them. The new *Gerstner Tool Chest*, here illustrated, has its space so apportioned as to make the various tools quickly available. This promotes orderliness and certainly should effect a saving in employees' time over the ineffectual scrambling-around-in-the-box method so frequently necessary with old-style tool boxes.

The new *Gerstner* has ten drawers of various lengths and inside depths. There is an upright center drawer large enough for a mechanic's handbook or a drill block. The long drawers will accommodate a 20" scale and space is sufficient for a complete set of tools and instruments. The chest may be had finished in an art leather covering or of polished quartered oak.

IF ANY OF YOUR EMPLOYEES NEED A NEW TOOL CHEST IT WILL WORK OUT TO YOUR ADVANTAGE TO ASSIST THEM IN OBTAINING ONE, BY WRITING H. GERSTNER & SONS, 56 COLUMBIA ST., DAYTON, O.

TUNGSTEN and TANTALUM **CEMENTED CARBIDE TOOLS**

We Design and Fabricate All Types: Standard, Semi-Standard, Special and Particular.

ALL TOOLS FINISH-GROUND ON DIAMOND WHEELS

Copper Brazing Service • *Prompt Delivery* • *Standard Tips in Stock*

LYONS MACHINE COMPANY

5601 TILLMAN AVE. WOodbine 2440 CLEVELAND, OHIO

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'More Goods for More People'

(Continued from page 23)

amount to $1,040. The cost of the material would be nominal, not more than a dollar or two, and the overhead could be calculated at about fifty per cent of the cost of labor. The watch upon which these estimates were based retails for $1.50."

Saftey pins are another common product used in almost every household, especially those in which there are babies. "Safety pin machines have seen their greatest development within the last six or seven years," reports Mr. J. A. O'Brien, President of De Long Hook and Eye Company. "Previously," he says, "women paid 10 cents for 12 safety pins. Today, they can buy 50 for the same price."

If it were not for the advanced status of machine tools and the "cleverness" of the machines made by them, another product almost indispensable to the modern home throughout the civilized world, the tin can, would, from a practical point of view, be non-existent today.

"The first tin containers were manufactured by a tinsmith almost wholly by hand, and a production of 60 cans per day per man was considered a good day's work," states Mr. O. C. Huffman, President of the Continental Can Company. "Canned foods were then a luxury enjoyed by only the rich. The improved tin container of today, manufactured on lines of machinery each producing 300 to 500 cans per minute, could not be produced by hand. Any machine shop which might undertake to make a modern tin container would first have to build equipment specifically for that purpose. Whether made by hand or under piecemeal machine-shop methods, the cost would no doubt be many times that of the modern can manufacturer, with the result that the cost to the consumer of canned foods and the many other products now packaged in tin containers would be prohibitive."

A similar disparity in costs is reported by the glass bottle industry. According to an executive of Owens-Illinois Glass Company, a four-ounce toilet bottle that now sells for $1.65 per gross in large quantities would cost, if made under earlier methods, four times their present cost.

(Continued on page 28)

TDM Shop Directory
Cleveland, Ohio

BARTH STAMPING AND MACHINE WORKS
3815 West 34th St. SHadyside 1857
DIE AND STAMPING ENGINEERS
Precision Tools, Dies, Jigs
SPECIAL MACHINERY

THE BUNELL MACHINE & TOOL CO.
1600 East 24th St. PRospect 2681
Designers and Manufacturers
Tools, Gauges, Jigs, Dies, *Special Machinery*

CLEVELAND UNIVERSAL JIG CO.
13404 St. Clair Ave. MUlberry 3322
Designers and Builders
Jigs, Fixtures Special Machines
Complete Plant Routing and Tooling
Production Engineering

THE DICKEY-GRABLER CO.
10302 Madison Ave. N. W. WOodbine 4172
Metal Stampings—Dies
MARKING DEVICES

HAHN MANUFACTURING CO.
5332 Hamilton Ave. ENdicott 2205
Dies, Tools, Fixtures
Special Machines
EQUIPPED FOR MEDIUM AND HEAVY TYPE WORK

THE INDUSTRIAL MACHINE CO.
Founded in 1903
1436 East 47th Street
Builders of Special Machinery
GENERAL MACHINE WORK

LYONS MACHINE COMPANY
5601 Tillman Ave. WOodbine 2440-2441
Manufacturers Special Machinery
Tools, Jigs, Fixtures
Tungsten Carbide Tools
SWISS JIG BORING

THE McKINNEY TOOL & MFG. CO.
1688 Arabella Rd. KEnmore 1681
Roller Die Forming Machines
Automatic Saw and Shear Cut-off Machines
DIE CASTING MACHINES
Special Machinery—Dies, Jigs and Fixtures

THE MAURICE MEYER CO.
1934 St. Clair Ave. PRospect 0849-0850
DESIGNERS AND BUILDERS
TOOLS and DIES
Experimental and Model Work

MODERN TOOL & DIE COMPANY
1051 Power Ave. CHerry 7440
Whitney Power Bldg.
DESIGNERS AND BUILDERS
Tools, Dies *Special Machinery*
STAMPINGS

When you order or write about products described in TDM PROGRESS please mention the publication.

"New Precision Sawing"

(Continued from page 9)

Speed in Feet per Minute	Material
110 to 150	General tool steel Oil-hardening tool steel Water-hardening tool steel Air-hardening tool steel
150 to 200	General low-carbon steel (0.10-0.25) Cold rolled steel Soft and mild steel Machine steel Cast iron Manganese and government bronze
200 to 300	Very soft and very mild steel Heavy-gage sheet steel Malleable iron Thin-walled sections Steel tubing Brass tubing
300 to 400	Thin sheet and tubing Duraluminum Hard brass
400 to 450	Aluminum Soft brass, Copper, Zinc Fibre, Molded plastics, Hard wood

Magnifying Glass Is Used

Because of the intricate and exacting nature of some of the jobs accomplished with the precision narrow blade sawing machine, a magnifying glass often is essential. A glass which magnifies approximately three times and is sufficiently large to permit the operator to watch the cutting action with both eyes is most satisfactory. Thus, painstaking precision work can be performed with greater ease and comfort. The craftsmanship and skill of a mechanic is brought out and encouraged in a machine of this kind where the hands and judgment of the operator contribute more than in most machine tools.

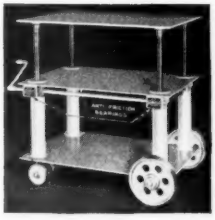
A large volume of chips is made in a day's work, and it is essential that a means be provided to dispose of them. It is also necessary to prevent the cuttings from piling up on top of the work so the operator can follow his lay-out lines. An air jet, through a flexible, adjustable cable, keeps the work free. Chips are carried down by the band saw and fall by gravity, outside the machine.

A screw feed which pushes the work into the saw may be used in small jobs. A hardened tip at the point of the screw engages the work. To assure a good contact, a center punch mark may be put on the edge of the work.

Automatic True Circles

The problem of cutting a true circle is simplified with the ingenious method of adjustable centers in the work-table, providing a pivoting point any desired distance from the saw. Hence, a disk of any diameter may be made by putting an axis on the plate or sheet stock to be cut and revolving the metal into the saw. There is practically no limit to the size of circles that may be cut by this method. Since thickness up to 8 inches may be cut with narrow blade saws the scope and range of work that may be handled with this circle cutting process is broad. An inside circle cut-out is made the same way except that the saw is brazed after it has been put through a starting hole.

WITH THE *Greatest of Ease*



The Hamilton Portable Elevating Table

(PATENTED)

- Moves heavy dies, jigs and fixtures from machine to machine
- Levels and supports overhanging pieces of work
- Transfers dies from shelf to press in production shops
- Always saves time and labor
- Safe — Indispensable — Inexpensive

Two sizes: 2000 lbs. and 5000 lbs. capacity

Write for circular

THE HAMILTON TOOL COMPANY

222 North B Street Hamilton, Ohio

When you order or write about products described in TDM PROGRESS please mention the publication.

'More Goods for More People'

(Continued from page 26)

"Those bottles are packed in service cartons," states Mr. E. F. Martin, Assistant Secretary-Treasurer of this company, "and are manufacturerd on our automatic machines. The cost of producing these bottles by hand methods, as practiced in the glass industry before the advent of the automatic machines, would necessitate a selling price of around $6.95 per gross."

The Goodyear Tire and Rubber Company reports that the conversion cost of making one of its representative products was, in 1917, $1.18. In 1935, this cost had been reduced to 84 cents. But, labor rates are higher today than in 1917 and an adjusted cost to take this important item properly into account would increase the 1917 cost from $1.18 to $2.08.

"Improvement in the art of production of tires," states Mr. C. H. Brook, Comptroller, "together with the increased use of machinery and tools and the greater amount of efficiency attained under management methods, together with increased production, account for this reduction in costs."

Farmers living in non-electrified areas who use a popular gas-mantle lamp to read by after dark should have, after reading the following statement of Mr. Sheldon Coleman, General Works Manager of the Coleman Lamp and Stove Company, a greater appreciation of the benefits of the modern factory which provides such a convenience at a price that makes it attainable.

"We estimate it would cost us approximately eight times as much," Mr. Coleman states, "to make practically any one of our 200 different items by machine shop methods than it actually does under modern mass production methods."

How about radios? Mr. Paul Jones, General Manager of the Home Appliance Division of Fairbanks, Morse & Company, states that "a console radio now retailing for $100 would have to be sold for $1,000 if it were made without the aid of practically any of the mass production facilities which we now employ."

"Our stoves, refrigerators, automotive transmissions and washing machines would cost anywhere from six to ten times what they do today if our plants were not tooled with modern equipment,"

(Continued on page 29)

TDM Shops, Cleveland, O.

OHIO TOOL COMPANY
3160 West 106th St. CLearwater 3200
DESIGNERS AND BUILDERS
Tools, Dies, Jigs, Fixtures
Special Machinery

THE PARAMOUNT TOOL CO.
1392-98 East 43d St. ENdicott 2220
Jigs, Fixtures, Dies
Experimental Work

THE PHOENIX ICE MACHINE CO.
2711 Church Ave. CHerry 1048
General Machine Work
Designers and Builders of Special Machinery

WM. PLOTZ MACHINE & FORGE CO.
1417 St. Clair N.E. PRospect 0441
General Machine Work
Special Machinery and Parts
Forgings of All Kinds

PROGRESSIVE MACHINE & TOOL CO.
109 Fountain Court MAin 3171
Jigs, Fixtures
Special Machinery

A. P. SCHRANER & COMPANY
3338 Payne Ave. HEnderson 8644
EXTERNAL CYLINDRICAL LAPPING MACHINES
Special Machinery
Tools, Dies, Jigs, Fixtures

THE SOMMER & ADAMS CO.
18511 Euclid Ave. KEnmore 0810-0811
DESIGNERS AND BUILDERS
Special Machinery
Tools, Jigs and Fixtures

Star Machine & Tool Co.
Established 1903
9320 Woodland Ave. GArfield 2060
DIES—JIGS
Jig Boring with
Pratt & Whitney Precision Equipment

TOOLS & GAGES, Inc.
3106 East 63d St. MIchigan 7230
"Let us be your tool room."
DESIGNERS AND BUILDERS
Tools, Gages, Dies, Jigs, Fixtures
Special Machinery

THE J. C. ULMER COMPANY
1791 East 38th St. HEnderson 4601
Tools, Dies, Jigs, Fixtures
Special Machinery
DESIGNING AND BUILDING
Experimental, Model, Punch Press and Screw Machine Work

THE VARIETY MACHINE & STAMPING CO.
4383 West 35th St. SHadyside 4422-4423
DESIGNERS AND MANUFACTURERS
Dies and Metal Stampings
We are equipped to make dies and stampings in production up to 250 tons capacity.

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'More Goods for More People'

(Continued from page 28)

estimates Mr. H. E. Blood, President, Norge Division, Borg-Warner Corporation.

"The result," he says, "would be that their use would be limited to all but a very few people who could afford to pay six to ten-fold more for them than they do today."

The textile field was early mechanized and tremendous saving in costs was passed long ago on to the consumer in the way of lower prices and better goods. But listen to Mr. J. F. Tinsley, Vice President and General Manager of the Crompton & Knowles Loom Works (the looms of this company have been known to generations):

"We make precision looms today of a type that did not exist a few years ago. These looms reduce weaving costs from 15% to 30%. Without the improvements that have been made in recent years in weaving machinery, the selling prices of fabrics would have to be much higher than they are today."

Many amateur sportsmen would be reduced to horseshoe pitching and other inexpensive pastimes of an earlier day if the multifarious and finely balanced sporting goods retailed in specialty, hardware and department stores today should suddenly be boosted four times higher than their current selling prices. This is the estimated increase in production cost furnished by Mr. W. F. Reach, General Manager of A. G. Spalding & Bros. Of further concern to the vast body of Americans is the probability of costs of sporting goods being further reduced when and if the industry should become more fully and efficiently mechanized.

(Continued on page 30)

TOOLS and DIES

Special Machinery

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SHEET METAL

Stampings and Assemblies

DAVIS

TOOL & ENGINEERING CO.

6481 Epworth Blvd. Detroit, Mich.

Tel. Tyler 46070

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TOOL STEEL TUBING

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for

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Stock up to 14" O. D. — 2" Wall

We stock also:

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- Mechanical Tubing
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BISSETT STEEL CO.

Mfrs. of BISCO *Tungsten Carbide Dies and Tools*

Fine Tool Steels

CLEVELAND

The Geo. H. Porter Steel Treating Co.

Heat Treating — *Carbonizing*

Annealing — *Case Hardening*

TOOL WORK OUR SPECIALTY

1225 Marquette St. **Tel. HEnderson 6601**

CLEVELAND, OHIO

When you order or write about products described in TDM PROGRESS please mention the publication.

'More Goods for More People'

(Continued from page 29)

"The airplane of today," states a leading aircraft manufacturer, Mr. C. N. Monteith, Vice President of the Boeing Aircraft Company, could not be produced according to the shop methods of earlier days—and, yet, there is no such thing as mass production in our industry. So far, the largest order for aircraft placed by the United States since the World War totaled but 200 units and consequently the term mass production is not applicable to aircraft. One of our recent military models was carefully analyzed as to probable production costs in various quantities. We obtained an indicated selling price of $50,000 for one; $22,500 each for 10; $9,775 each for 100 and a projected selling price of $4,500 each were we to produce 1,000 units. In these computations, at least half of the saving results from the increased mechanization of operations."

Mr. M. B. Gordon, Vice President of the Wright Aeronautical Corporation, is of the belief that their "aircraft engines if made piecemeal by machine shop methods, would cost from four to six times their cost when made with modern production equipment. This difference would be greater if the volume of our production warranted the adoption of extreme quantity production measures such as are used in the motor car field."

Similarly, an electric refrigerator manufacturer, Mr. Louis Ruthenberg, President of Servel, Inc., reports that refrigerators made experimentally cost approximately six times as much as those made on production assembly. . . .

One sidelight revealed by our inquiry is the comment of a manufacturer, already quoted, to the effect that Mr. Chrysler's estimate of $3,500 as the machine-shop cost of making the modern-day car which sells for $600, is preposterously low. According to this manufacturer, his own personal experience convinces him of the fact that the car *costing* $3,500 to make at the beginning of the century lacked many of the refinements that are taken for granted as ordinary in the present-day car *selling* for about $600.

A sidelight on why automobiles *are* so phenomenally cheap today can be deduced from information furnished by the Bethlehem Steel Company on the steady decrease in steel prices. In this business of getting products to market cheaply it is necessary for all branches to be highly mechanized. Mr. F. A. Shick, Vice President and Comptroller, points out in this connection that the price of steel strip and sheets has gone down 50 per cent in the period from 1923 to 1935; and that the automobile industry is the largest single consumer of these products of the steel industry. At the same time the quality and size and uniformity of the products of steel mills have been steadily rising.

"While automobile construction in 1935 was 20 per cent below the peak year of 1929, it is estimated that the automobile industry used a larger tonnage of steel in 1935 than in 1929," comments Mr. Shick.

According to the American Iron and Steel Institute, the average selling price per ton of sheets in 1923 was $100.15; in 1934, this price was down to $53.66.

Without cost-reducing mechanized production in steel, automobile manufacturers could not today turn out $600 machines either in dozen or in million lots.

DEDICATED to DUTY . .

Without fear of failure!

No. 360-4, speed—6000 r. p. m.; cap.-6" wheels

HERCULES

A general purpose pneumatic grinder that has proven its worth in thousands of shops, on thousands of tasks. Same design available in wide range of sizes.

THE BUCKEYE PORTABLE TOOL CO.
Dayton, Ohio, U.S.A.
Representatives in Principal Cities

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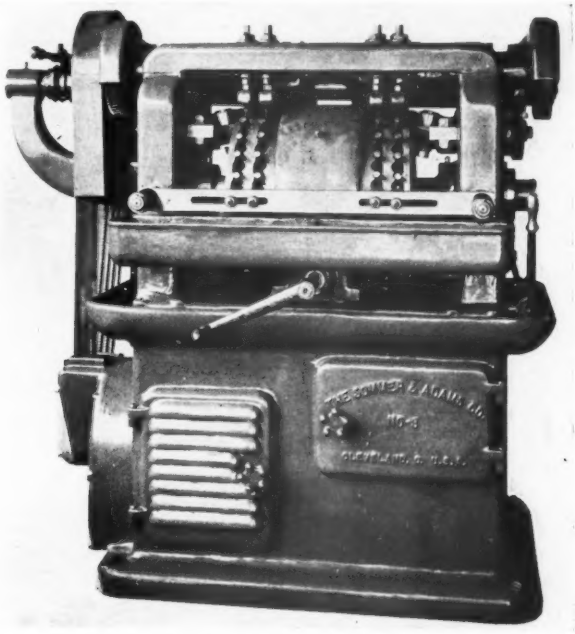
THE NEW IMPROVED CRAFTSMAN

Rotary Milling Machine

greatly increases production—drastically reduces costs of

CASTELLATING, SCREW-SLOTTING
STRADDLE *and* PLAIN MILLING



More than 400 in successful use

Have You a Difficult Milling Problem?
Let Us Help You Solve It.

The Sommer & Adams Company

Specialists in the design and manufacture of machines for
CONTINUOUS MILLING

TOOLS • JIGS • FIXTURES • SPECIAL MACHINERY

18511 Euclid Avenue *Detroit Representative* **Cleveland, Ohio**

JOHN E. LIVINGSTONE & CO., 2921 East Grand Boulevard

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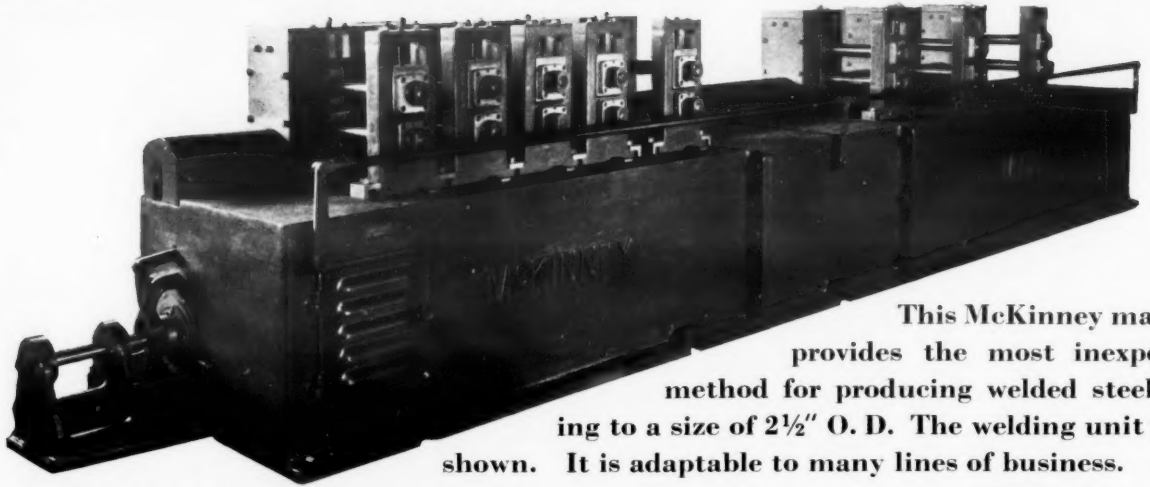
The Newest Model McKINNEY Roller Die Forming Machine

More compact
Less expensive to operate
More flexible and efficient
Larger output
Lower cost of production



This McKinney machine provides the most inexpensive method for producing welded steel tubing to a size of 2½" O. D. The welding unit is not shown. It is adaptable to many lines of business.

THE McKINNEY TOOL & MANUFACTURING CO.

1688 Arabella Road - CLEVELAND, OHIO
7310 Woodward Ave. - DETROIT, MICH.

Manufacturers also of: Automatic Saw and Shear Cut-off Machines - Dies - Jigs - Fixtures - Special Machinery

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